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## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The invention relates to a method as well as a device for guiding and supporting a comparatively thin sheet metal or metal strip during transport across a conveying device, such as a rolling table, and/or during, before or after a cutting process when passing through shears, wherein the sheet metal or strip at least at its underside is loaded with an energy-rich bundle of jets of a liquid or gaseous medium and is thereby supported and guided by means of impulse energy and the medium is guided under pressure through supply channels in the interior of the transport and/or blade carrier drums to jet nozzles at their periphery and exits as a closed jet from them before and/or behind the support areas of the drum, or as closely as possible adjacent to the blades of the blade drum, against the sheet metal or strip at a slant or a substantially perpendicular angle relative to the sheet metal or strip.

### 2. Discussion of the Relevant Art

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## SUMMARY OF THE INVENTION

Based on the aforementioned prior art, it is an object of the invention to safely guide thin sheet metal or strips during transport across a conveying device, such as a roll table, and/or during, before or after a cutting process when passing through shears and to have the medium act only in that area which is beneficial for stabilizing the strip, and, on the other hand, to prevent an ineffective media use and, at the same time, to avoid flooding of the surroundings of the strip or the shears and the transport device with excess medium.

As a solution to this object it is proposed with the invention in connection with a method of the aforementioned kind that the medium, by means of a rotary valve arranged at an end face of the rotatable transport or blade drum, exits in a limited angular position of a drum from jet nozzles directed against the sheet metal or metal strip.

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A device for guiding and supporting a thin sheet metal or metal strip, in particular, for performing the method according to the invention Is characterized in that between the supply channels of a drum and a source for the medium to be supplied under pressure at least one pump and at least one rotary valve are arranged and in that the rotary valve is preferably arranged at an end face of a drum.

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BRIEF DESCRIPTION OF THE DRAWINGS

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Further details, features, and advantages of the invention result from the following explanation of several embodiments illustrated schematically in the drawings. It is shown in:

Fig. 1 in a representation similar to a flow chart a transport drum with supply channels and jet nozzles arranged therein, with a rotary valve at the end face, pressure pump, and media source;

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**SECTION "DESCRIPTION OF PREFERRED EMBODIMENTS BEGINNING ON PAGE 7 AND ENDING ON PAGE 10**

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DESCRIPTION OF PREFERRED EMBODIMENTS

The purely schematic illustration of Fig. 1 shows supply channels 4 arranged in a transport drum 7 for supplying the jet nozzles 5 and 5' formed therein. Opposite the end face of the transport drum 7 a rotary valve 9 is arranged which is connected with a central bore 20 to a conveying line 23, extending from a pressure pump 22, for a liquid medium. The rotary valve 9 is arranged so as to be non-rotatable while the transport drum 7 rotates relative thereto when functioning as a transport drum 7 or blade drum 8, as is known in the art. Connecting channels 21, 21' beginning at the central bore 20 and having exit openings at the side facing the end face of the transport drum 7 are provided in the rotary valve 9. Medium that is under pressure is released always when the openings of the supply channels 4 coincide with the oppositely oriented openings of the connecting channels 21 in the rotational direction to thus allow flow in a limited angular range. In other angular positions of the transport drum 7, the supply channels 4 of the transport drum 7 cannot be flushed with pressure medium. It is also possible to adjust different ejection widths with the jet nozzles.

Moreover, the pressure pump 22 with its motor 22' can be controlled via a signal and switching device, similar to the device illustrated in Fig. 4, for example, according to the requirements of an incoming metal strip 1. The pressure pump 22 takes in a liquid medium from the medium source 25 through the intake line 24.

Fig. 2 shows as an example a blade carrier drum 8, 8' with a device

(2, 2', 5) for guiding and supporting a comparatively thin sheet metal or metal strip 1. The blade carrier drums are provided with blades 6 in a manner known in the art which interact with one another and cut the metal strip 1 in the cutting plane y-y when contacting one another. The latter is transported on the rolling table 10 and during the cutting process is guided and stabilized from below (bottom side 1') or from below and from above by bundles of jets 2, 2' exiting from the jet nozzles 5. The jet nozzles 5, 5' are arranged such that they secure at both sides of the cutting plane y-y the strip 1 in the given position and, in particular, prevent a slanting out of the transport direction. Moreover, in regard to the shearing-off shears 13, same elements are identified with same reference numerals.

In Fig. 3 a similar arrangement is shown with the difference that the shears are chisel-type shears 3 with a cutting chisel 11 wherein a counter drum 8' is correlated with the blade drum 8 provided with the chisel. In this connection, it must be prevented that the strip 1 during cutting by the cutting chisel 11 bonds to the smooth surface or adheres thereto because then the cut leading edge of the strip would be deformed. Accordingly, the blade drum 8 and, in particular, the anvil drum 8' are provided with supply channels 4, 4' in the aforementioned axis-parallel arrangement which have jet nozzles from which jet bundles 2, 2' of a liquid medium exit and reliably prevent the leading edge of the strip that has been cut from being bonded to or adhering on the counter drum 8'.

Fig. 4 shows a further similar arrangement with chisel-type shears 3 in which between the shears and the rolling table 10 guide wedges 15 are arranged. They have jet nozzles 5 for medium-loaded supply channels 4 which are connected to medium supply lines 29 having a pressure pump 27 arranged therein. Above the sheet metal or metal

strip 1 a signaling device 19 monitoring the introduction of the strip at the strip head 16 is provided, wherein the signaling device is in communication via a signal line 26 with the motor 28 of the pressure pump. The pressure pump is supplied with the liquid medium in a manner known in the art from the medium source 25 by means of a suction line. The passage of the strip head 16 of the metal strip 1 is detected by the signaling device 19 which then activates via the signal line 26 the switch for the motor 28 and thus starts the pressure pump 27. The latter conveys the pressure medium through the supply line 29 via the supply channels 4 to the jet nozzles 5. The principle holds true for all jet nozzles, also those in the drums. A signaling device must detect the strip head and the cut. The jet nozzles are then loaded only briefly at the strip head and the cut. The signal can also be used by a device which is already present anyway.

Moreover, the chisel drum of the chisel-type shears 3, 3' is in communication via the rotary valve 9 (not shown in Fig. 4) with the supply channel 4' and the jet nozzles 5' such that a bundled medium jet 2' impinges with high energy from below against the metal strip 1 in the area of the strip head 16 and prevents that the comparatively thin and bendable strip 1 bends downwardly and impacts against the guide wedge 15 to the right and is thereby deformed.

Only during the further course of the strip transport, after a certain amount of time or a measured advancing of the metal strip 1, the chisel-type shears 3, 3' are activated and a predetermined length of strip is cut off, wherein the supply channels 4'' of the chisel drum and the counter drum previously unused cooperate with the rotary valve 9 take over the guiding of the strip 1 by means of energy-rich media jets.